

APPENDIX E

TOW EMPLOYMENT IN RESTRICTIVE TERRAIN

The infantry fights best in restrictive terrain. However, the TOW missile system is optimized in unrestricted terrain. A thorough METT-TC analysis is necessary to choose the best employment option. Although the M2 or MK19 is of better use in restrictive terrain, antiarmor leaders must know when and how to effectively employ the TOW to support infantry in the same terrain.

E-1. DEFINITION

Restrictive terrain is defined as terrain that hinders movement to some degree. Little effort is needed to enhance mobility, but units may need to detour frequently. Units may have difficulty maintaining optimum speed or combat formation. Antiarmor leaders must recognize TOW system limitations and take advantage of the TOW system's capabilities in restrictive terrain. The types of terrain described below are examples of the types of restrictive terrain in which infantry forces operate. Often the categories blend together (for example, forests and steep hills).

a. **Forests and Jungles.** The degree and type of vegetation affects mounted movement, altering formations and speeds. Typically, armored vehicles will take advantage of roads or trails to move through these areas as quickly as possible. The ability to mass antiarmor fires on a slowed, contained enemy armored force may outweigh the degraded effectiveness of wire-guided missiles in this environment.

(1) **European-Model Forests.** These forests are well tended, free of underbrush or secondary growth, and often hilly. Unopposed armored forces can traverse these forests rapidly because of a large number of good trails. If armored vehicles are forced off the trails, the thickness and spacing of trees and the degree of slope determine how freely they can maneuver. The lack of undergrowth often allows visibility to several hundred meters.

(2) **Cut-Over or Primeval Forests and Jungles.** These forests have thick patches of vegetation and poor trail networks. Armored vehicles can travel through these forests if the ground is dry and not too steep, but such "jungle-busting" is slow and visibility and engagement ranges are short--often measured in the tens of meters. TOW employment is seriously degraded unless fire lanes are cut through the underbrush.

b. **Hills and Mountain Ranges.** The degree of slope and vegetation affect the mounted movement, altering formations and speeds.

(1) Forested hills usually force armored vehicles to move on trails, which canalizes mounted movement. This restriction allows carefully positioned TOW systems to engage enemy vehicles unable to maneuver out of an engagement area. However, because tree growth and underbrush restrict visibility and engagement ranges, antiarmor leaders carefully place the TOW systems for as maximum a range as possible.

(2) Bare hills and mountains, where steep terrain and lack of roads again canalize maneuver, often allow engagement out to maximum TOW ranges. However, if an antiarmor unit emplaces TOW systems in obvious positions, a mounted enemy can suppress them with direct and indirect fires. To avoid obvious positions, an antiarmor unit may emplace the TOW systems in locations that sacrifice standoff. This increases their protection from preplanned enemy suppressive fires (direct and indirect) and allows them to gain surprise.

c. **Swamps and Wetlands.** Swamps stop mounted movement except on any hard-surfaced, elevated roads that pass through them. Flood plains and moors can support lightly armored vehicles, but this type of terrain is often trafficable only during dry periods. In northern Europe, terrain broken by drainage ditches and dikes is common; this type of terrain prevents armored vehicles from moving off roads. Clear weather and good visibility provide the antiarmor unit with better observation, resulting in TOW engagements of 2000 to 3750 meters. However, better visibility also aids the enemy in suppressing obvious TOW system firing positions.

d. **Urban Areas and Villages.** The world is becoming increasingly urbanized, and antiarmor units will likely find themselves employed during urban operations. This environment obviously affects TOW system employment. See Chapter 6, Urban Operations, for more information.

E-2. MANEUVER

Light infantry forces normally are employed on restrictive terrain that makes TOW employment more challenging. The TOW must be moved and positioned on terrain that supports the infantry, but it can be positioned apart from infantry positions. The antiarmor company or platoon can be moved on a separate axis of advance with task-organized infantry to provide security. Timing of the attack is critical. This is complicated because the main attack force (infantry) usually moves from the attack position to the objective on foot while the antiarmor unit usually moves by vehicle to its supporting position.

E-3. PROTECTION

In restrictive terrain, the antiarmor unit requires protection from close assault since it has limited, or no, armor protection and limited self-defense capabilities. Only after conducting a detailed analysis of the factors of METT-TC does the commander (or platoon leader) decide how to move the antiarmor unit. Options include--

- Attaching an antiarmor platoon to an infantry company.
- Attaching an infantry platoon to an antiarmor company.
- Attaching an infantry squad to an antiarmor platoon.
- Moving antiarmor unit's vehicles within the battalion formation.

E-4 GUIDELINES FOR TOW EMPLOYMENT

The basics of TOW employment outlined in Chapters 4 through 8 and direct fire planning and control described in Appendix C still apply when antiarmor units operate on restrictive terrain. However, commanders and leaders must look at these basics from a different perspective; certain principles may be more important than others, depending on the situation. Leaders can best employ the TOW missile in ambush scenarios where antiarmor units fire from unobtrusive positions to surprise the enemy and where TOW, infantry fires, mines, and indirect fires are closely coordinated. Finally, commanders must realize that employing the TOW in restrictive terrain is less than ideal, and they should do so only if the results of a detailed METT-TC analysis dictate it. The seven principles of TOW employment have been modified for consideration in restrictive terrain.

a. **Mutual Support.** Mutual support is vital when terrain inhibits the engagement range. Instead of massing the TOW missile fires from the antiarmor company into an engagement area, leaders may have to mass fires with other infantry weapons systems (M2,

MK19, Javelin, and AT4) and indirect fires.

b. **Security.** Shorter engagement ranges and ample concealment make antiarmor squads employing TOWs more vulnerable to dismounted enemy infantry. Therefore, the antiarmor unit should be positioned so that the infantry can protect it. If the infantry is not available, the antiarmor unit must protect itself by task-organizing the unit with some soldiers operating the TOW systems and other soldiers providing security with small arms or with M2 or MK19.

c. **Flank Shots.** The feasibility of flank shots often determines whether TOW systems should be employed, especially in restrictive terrain. Flank shots provide the largest view of the target and come from an unexpected direction. Enemy armored vehicles are better protected on the frontal slope; crew orientation is primarily to the front; and it is difficult to traverse a turret in most restrictive terrain. An enemy tank gunner or commander will fire his main gun or coaxial machine gun as a reaction to the flash of a TOW missile launch. The TOW gunner could lose focus on, and control of, the missile after seeing the enemy return fire. Leaders should strive for flank shots in restrictive terrain.

d. **Volley Fire.** Volley fire (also referred to as simultaneous fire) is used to rapidly mass the effects of fires or to gain immediate fires superiority over an enemy. It is also used to negate a low probability of hit given the terrain and expected engagement ranges. Antiarmor units need not volley fire TOW missiles only. Other weapon systems may be employed to complement the TOW to gain immediate fire superiority.

e. **Cover and Concealment.** Cover and concealment are especially important for TOW firing positions in restrictive terrain. Although antiarmor units try to fight from prepared positions, engineers may not be available to modify the terrain. Therefore, antiarmor units must often employ TOW missiles from hasty positions, mounted or dismounted. In restrictive terrain, antiarmor units use the existing terrain for cover and concealment.

f. **Employment in Depth.** Restrictive terrain limits TOW employment in depth for antiarmor. Depth in restricted terrain is achieved by focusing on where (or how) to destroy the enemy, not where to locate the system. One method is to emplace TOW systems so they each can fire into an engagement area from different locations (rear and flanks) at the same time. Strict direct fire control measures must be implemented to reduce the risk of fratricide (see Appendix C, Direct Fire Planning and Control). Another method to achieve depth is to designate different weapons systems (M2, MK19, Javelin, AT4) to engage different enemy targets throughout an engagement area or an area of operations.

g. **Employment as Part of Combined Arms Team.** This is especially important in restrictive terrain. Assets such as TOW, M2, MK19, Javelin, AT4, mines and other obstacles, small arms or machine guns, M203 grenade launchers, and indirect fires must be skillfully blended to achieve the desired effect on the enemy. Antiarmor weapon systems (for example, TOW) alone will not be sufficient. Leaders must position all assets so that rounds impact on the appropriate portions of the enemy formation.

NOTE: Integration of indirect fires into massed direct ATMG fires enhances the effect of a unit's engagements. Mortar and artillery fires can damage TOW wires, causing missiles to miss targets. Leaders must ensure adequate fire control measures are implemented to prevent indirect fires from falling between the antiarmor unit and the targets during TOW engagements.

E-5. OFFENSIVE OPERATIONS

Antiarmor units seldom provide more than limited support with TOWs to dismounted infantry units attacking through restrictive terrain. The antiarmor units have little chance to reconnoiter beyond the LD, and when employing the TOW they may lack the necessary ranges. However, the TOW can still be used effectively if a careful reconnaissance is performed and if a detailed analysis of the factors of METT-TC allows it.

a. **Attack.** Antiarmor units are most useful when providing direct fire TOW support for a planned attack. They fire missiles at hard targets such as bunkers, weapons emplacements within trench systems, fortified rooms in houses, and dug-in vehicles. See Appendix A, Weapon Reference Data, for round-target selection. Although TOW rounds are less effective than HEAT or high explosive, plastic (HEP) rounds against bunkers, the antiarmor unit's vehicle (HMMWV or ICV) has better mobility in restrictive terrain than a tank. The antiarmor leader (or support force leader) and assault force commander must ensure that signals for ceasing fires and designating targets (for example, AN/PEQ-2A, M203 smoke, various colored star clusters, or infrared chemical lights) are well coordinated before the attack begins.

b. **Armored Enemy.** An armored enemy typically defends from well-prepared vehicle fighting positions that are supported by dug-in infantry. While providing overwatching fire, TOWs must be employed at least 1,000 meters from the enemy armored vehicles to survive. Even then, they can only survive if they surprise the enemy. Directly supporting the infantry attack in restrictive terrain is extremely risky. Other options for TOW employment are--

- Employ TOWs to isolate the enemy in the restrictive terrain, focusing on mounted enemy avenues of approach.
- Protect consolidating infantry or follow-on forces from armor counterattack.

c. **Dismounted Enemy.** A dismounted enemy relies mainly on dug-in infantry (possibly reinforced with dug-in armored vehicles) on terrain that severely inhibits vehicular movement. TOW systems can be used dismounted, which usually makes stealthy occupation of positions easier. Antiarmor units must carry the TOW systems to reach good firing positions, making movement slower and more difficult. Carrying a dismounted TOW system limits an antiarmor section to one system. If an infantry squad is available, its members can carry the extra missiles and provide security; if not, one antiarmor squad in the section carries the extra missiles and provides security.

E-6. DEFENSIVE OPERATIONS

Commanders can use the TOW effectively more often in restrictive terrain during defensive operations than during offensive operations. A defender has more time to conduct a thorough analysis of the factors of METT-TC, to conduct a detailed ground reconnaissance, and to prepare his area of operations.

a. **Integration of Direct and Indirect Fires.** The restrictive terrain prevents the enemy from isolating and concentrating on single defending elements. The most desirable method for destroying enemy formations, even in restrictive terrain, is to integrate the direct fires of all of the available weapons and weapon systems and indirect fires with existing and reinforcing obstacles. The defender must overwhelm the entire enemy formation throughout an area of operation with direct and indirect fires. However, this must be coordinated and rehearsed. If the defenders fail to mass fires throughout the enemy formation, the enemy can counterattack or suppress individual defending elements.

b. **Enemy Employment of Obscurants.** A mounted enemy will plan to use smoke to conceal his movement across open danger areas or anticipated engagement areas. Although antiarmor units are equipped with thermal sights and can observe and engage through most kinds of smoke, leaders must ensure that accurate range cards are prepared.

c. **Antiarmor Reserves.** Commanders may not find suitable terrain to support company or battalion engagement areas within the battalion's area of operations, or they may find that terrain dictates long, narrow TOW sectors of fire. In either case, antiarmor units employing TOW can be designated as the reserve with several clearly defined missions. For each mission, they move to hasty firing positions to counterattack or block enemy penetrations. Routes and firing positions are prepared and the antiarmor unit rehearses daytime and nighttime occupation. Counterattacks work best when TOW fires are combined with other fires (direct and indirect). Antiarmor units rehearse these missions; they use engineers to reinforce existing natural positions or, at least, to construct hasty vehicle firing positions. If only one good, platoon-sized engagement area exists, commanders can position antiarmor units to cover it with TOW fires.